in the thoroughfare. Hence, if traffic on a road flows in the north-south direction, and the adjacent cell to the north of the cell of interest is experiencing higher than the analog equivalent average traffic level, while the adjacent cell to the south of the cell of interest is experiencing wireless traffic level lower than or equal to the analog equivalent average wireless traffic level, a conclusion is reached that the potential traffic jam on the section of the road is in the northbound direction.

If it is determined in step **405** that the value of the cell counter exceeds the expected average by more than an illustrative value of 50%, in step **406** a message that is indicative of presence of bottlenecks in the section of the thoroughfare (associated with the cell profile) is delivered to subscribers in that cell and other affected adjacent cell(s). If, however, it is determined in step **405** that the cell count is less than 50%, then a warning message that is indicative of the presence of a potential bottleneck in the section of the thoroughfare (associated with the cell profile) is delivered in step **407** to subscribers in that cell and other affected adjacent cell(s). The format in which those messages may be delivered is described below.

It is worth noting that in some instances the registration counter may be used as well to estimate road traffic conditions. For example, when the location area covers a geographical area that can be associated with a section of a thoroughfare, the number of active-idle mobile devices registered in that location area may be used to estimate road traffic conditions on that section of the thoroughfare. Alternatively, when a wireless network implements a registration scheme that requires mobile devices to register at the cell level, as opposed to location area level, the technique described in conjunction with FIG. **4** could also be used.

A second road traffic estimation and delivery process of the invention is initiated in step **501** when CPU **101** compares the value of the exception counter C to the cell count A. When the exception counter has a value that is more than 25% of the value of the cell counter, as determined in step **502**, CPU **101**, in step **503**, retrieves the cell profile table of FIG. **2**. Thereafter, CPU **101**, in step **504**, identifies the direction of a potential traffic jam using the techniques described earlier. If the value of the exception counter is over haft the value of the exception counter, as determined in step **505**, then a message that is indicative of presence of bottlenecks in the section of the thoroughfare (indicated by the cell profile) is delivered to subscribers in that cell and other affected adjacent cell(s). If however, it is determined in step **505** that the cell count is less than 50%, then in step **507** a warning message that is indicative of the presence of a potential bottleneck in the section of the thoroughfare (associated with the cell profile) is delivered to subscribers in that cell and other affected adjacent cell(s).

The aforementioned messages may be delivered in audible format via a call initiated by Voice Information System **53** to a subscriber. The message may also include alternate routing information (associated with the cell) to allow the subscriber to avoid the congested section of the thoroughfare. When the mobile end-user device is a wireless data terminal, the message may be delivered in graphical format in the form of a digital map indicating the location of the bottleneck and directions to other less congested roads. When call waiting features are available for the mobile end-user devices **90–93**, an appropriate road condition message may be delivered to a subscriber even when the mobile end-user device of the subscriber is in an active-busy state. Similarly, when the mobile end-user device has simultaneous voice data capability, a digital map can be delivered to a monitor connected to the mobile end-user device even when the device is in an active-busy state.

It should be noted that the values of the exception counter that trigger the road traffic estimation and message delivery process are provided for illustrative and pedagogical purposes and therefore do not limit the scope of the invention when other values are used.

It is also worth noting that a combination of the techniques described in conjunction of FIGS. **4** and **5** could be used to implement the principles of the invention. For example, a message indicative of presence of bottleneck in a section of a thoroughfare (associated with a cell profile) could be delivered to subscribers in that cell when both conditions of a two-prong test are satisfied. The first condition may require, for example, that a certain number of active-busy devices in a cell exceed the past average analog amount of time spent in that cell while the second condition may dictate that the number of active-busy devices in a cell exceed the expected average (analog equivalent) number of active-busy devices by a certain percentage value.

According to one aspect of the invention, users may subscribe to the road traffic estimation and delivery service of the invention by pre-registering for the service. Hence, when a bottleneck occurs on a road that is associated in a cell where the mobile end-user device of the subscriber is active, Voice Information System **53** delivers one of the messages described above to the subscriber. Alternatively, the user may provide an itinerary by speech input or DTMF signal to Voice Information Service **53** which delivers appropriate messages (received from CPU **101**) to the subscriber whenever congestion occurs in sections of the road associated with that itinerary.

The foregoing is to be, construed as only being illustrative embodiments of this invention. Persons skilled in the art can easily conceive of alternative arrangements providing functionality similar to this embodiment without any deviation from the fundamental principles or the scope of this invention.

We claim:

1. A method of determining road traffic conditions in thoroughfares located in radio coverage areas served by a wireless communications network including a plurality of base stations, each serving a cell in the radio coverage areas and a wireless switch coupled to the plurality of base stations, said method comprising the steps of:

receiving from each of a plurality of cells, via said wireless switch coupled to a base station associated with the cell, real-time registration and cell activity data from active mobile end-user devices currently located in each of said plurality of cells served by the wireless communications network; and

estimating road traffic conditions in at least one thoroughfare located in said at least one of said radio coverage areas based on a comparison of said real-time registration and cells' activity data to past analog equivalent information previously collected by said wireless communications network for said at least one of said radio coverage areas.

2. The method of claim **1** wherein information associated with said estimated road traffic conditions is delivered to at least one user of one of said mobile end-user devices.

3. The method of claim **2** wherein said information associated with said estimated road traffic conditions is delivered in audible format to said at least one user of one of said mobile end-user devices.

4. The method of claim **2** wherein said information associated with said estimated road traffic conditions is